IAIMS and the Library at the University of Utah*

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ABSTRACT

The formal creation of an Integrated Academic Information Management System (IAIMS) at the University of Utah began in the fall of 1983. The keystone of the IAIMS effort is the HELP hospital information system. IAIMS at the University of Utah is a broad-based program extending across the Health Sciences Center and beyond to health professionals throughout the intermountain area. This paper describes the background that led to IAIMS, the IAIMS planning process, and the library's participation in this effort.

AN ACCURATE assessment of the Matheson Report, "Academic Information in the Academic Health Sciences Center: Roles for the Library in Information Management" [1], is still in the future, although after three years, it is difficult to remember when libraries weren't working in an Integrated Academic Information Management System (IAIMS) environment. No topic in recent times has received more attention in meetings, publications, and one-on-one discussions, yet much of IAIMS remains unexplored territory. Librarians are being challenged by new responsibilities and technologies. IAIMS encompasses an enormous range—from the minutiae of data communications protocols to the staggering problems of institutional information policy. To a significant degree, these problems are central to the power of the IAIMS concept. IAIMS offers an institutional rather than just a library framework for assertive long-range planning and management of information resources.

Following the publication of the Matheson Report in October 1982, momentum built for the librarians at the Spencer S. Eccles Health Sciences Library at the University of Utah to embrace the IAIMS concept and to take control of the library's future. The library's participation in the university's successful proposal for a National Library of Medicine IAIMS planning contract has been its most significant project in the last fifteen years. This paper describes the process, problems, and opportunities that resulted from this first phase of the IAIMS initiative.

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BACKGROUND

The library's involvement in automation began in 1969, when it joined the PHILSOM network. Automation in the library followed a pattern of specific functional applications. Cataloging and circulation were managed with the Online Computer Library Center (OCLC) and Computer Library Service, Inc., (CLSI) systems. Locally developed software was used for computer-assisted instruction and for the production of *MEDOC: Index to U.S. Government Publications in the Medical and Health Sciences.* A particularly important step was a grant from the National Library of Medicine in 1981 for the redesign of *MEDOC,* which included the installation of a DEC PDP 11/23 minicomputer in the library. Unlimited access to this on-site computer gave the library the opportunity for local computer support.

By the summer of 1982, planning had begun for integrating the various independent computer applications in the library. The first and most critical step was a strategy to sell the concept of an integrated library system (ILS) to the administration of the university. A strategy emphasizing the

value of automated access to library services was devised, with emphasis on providing the same level of service the user would receive on a visit to the library. The deans of the colleges and the School of Medicine and the vice president for health sciences endorsed the project, which resulted in appointment of an ILS Planning Committee that included representatives from the School of Medicine, College of Nursing, College of Pharmacy, College of Health, and University Hospital.

IAIMS Request for Proposals

In March 1983, the National Library of Medicine issued an RFP (Request For Proposals) for "IAIMS Strategic Planning—Phase 1." The RFP, the Matheson Report, and the AAMC's *The Management of Information in Academic Medicine* [2] were presented to the ILS Planning Committee. IAIMS was endorsed enthusiastically and a proposal was submitted as an institutional response. The ILS Planning Committee became the IAIMS Task Force.

The university was well positioned to respond to the RFP. An important attribute of a Stage 2 IAIMS, as described in the Matheson Report, is that "Medical information sciences is organized as an academic department of the school of medicine" [3]. In 1963, the Department of Biophysics and Bioengineering, recently renamed the Department of Medical Informatics, was established in the School of Medicine. Dr. Homer R. Warner, chairman of the department and an original member of the ILS Planning Committee, was appointed special assistant and principal investigator for the proposed IAIMS project.

Immediately prior to the release of the RFP, the library had successfully sponsored its first InfoFair. The program introduced faculty, staff, and students to innovative approaches to information management and identified the library with concepts central to IAIMS.

The keystone of IAIMS at the university was installation of the Health Evaluation through Logical Processing (HELP) Hospital Information System by University Hospital. The HELP system, designed by Warner, is a comprehensive, hospital-based computer system for acquiring medical information and implementing medical logic. A by-product of the system is its ability to capture and make accessible massive amounts of patient-generated information. However, the unique capability of the HELP system is its "expert" component, which provides assistance in clinical decision making. For example, during diagnostic procedures, one component of the HELP system evaluates clinical data from automated and manual sources as they are added to the system. These evaluations are presented to the physician for possible action. Automated access to the patient-generated data and the research and education opportunities provided by the HELP system are resources upon which a successful IAIMS could be built.

Educational Challenges and Opportunities

During the preparation of the IAIMS proposal, it became clear that basic education in the use of computers was necessary in order to meet education demands and to identify IAIMS with this new territory. With IAIMS sponsorship, three educational programs were offered. The first, "An Introduction to Microcomputers," attended by more than 250 teachers, staff members, and students, was presented in the library by librarians. Both the classes and the public-access microcomputers were important new additions that placed more demands on library services and resources. An already overextended acquisitions budget was stretched to include computer software and popular computer journals and monographs.

As the cadre of experienced microcomputer users expanded, current awareness educational needs were met through joint efforts of IAIMS and the Medical Center Small Computer Users Group (MCSCUG). Monthly meetings, held during the lunch hour, explored a wide range of topics. Presentations included computer analysis of injury potential for the gymnastics team, recent innovations in networking, and the first campus demonstration of the Macintosh. A monthly newsletter, received by more than 1,000 teachers, staff members, and students, discussed local developments, new software, and the progress of the IAIMS project. Three editions of the *MCSCUG Hardware Directory* were published as part of the IAIMS project. (The directory, arranged by hardware vendor, proved to be a useful tool for MCSCUG members in evaluating and selecting hardware and software.)

The IAIMS project joined the library in sponsoring an annual InfoFair and three special seminars during the first year of the contract. The objective was to continue the momentum of interest in new technology and to introduce topics particularly relevant to IAIMS. Seminars included a review of the basics in knowledge engineering; networking requirements of the hospital information system at the University of California, San Francisco; and a seminar on computer-assisted instruction (CAI), designed to encourage local CAI. More recently,

education efforts have focused on end-user searching of online databases.

Strategic Planning

While educational programs kept IAIMS in the spotlight, the central task of the project, as stated in the RFP, was to "undertake institution-wide strategic planning leading to the formulation and design of an Integrated Academic Information Management System (IAIMS) for its institution." The concepts of strategic planning, virtually unknown at the beginning of the IAIMS project, have proved to be essential in meeting the challenges of IAIMS.

Strategic planning forces a library to look beyond its daily problems, to consciously adopt a broad, long-range view. Specifically, "a library's strategic planning process encompasses its mission statement, goals, objectives, strategies, alternatives and contingencies, policies, and resource allocations, and the implementation and evaluation" [4]. The tasks outlined by the National Library of Medicine in the Statement of Work provided a framework for an institutional strategic plan to:

1. Implement a strategic planning process for information management;
2. Conduct a series of self-studies; and
3. Plan an institutional IAIMS.

Initial efforts were directed toward conducting self-studies and the environmental assessment, because these tasks were readily understood. The self-studies identified existing technological and human resources that would be involved in an integrated system. An inventory was conducted to identify major computing resources currently in place. Productive lines of communication were established with the technical support staff who operate the various computing facilities. While the support of the faculty and administration is essential to IAIMS, the staff members who are directly responsible for the operation and maintenance can make a significant contribution.

The self-study laid the groundwork for the environmental assessment. Strengths within the institution included the HELP system and a vice president for health sciences who viewed IAIMS as a major area of activity. An assessment of the state funding environment showed that despite a positive attitude toward education and innovation in Utah, there is a need for creative efforts to support IAIMS. With the nation's highest birthrate, Utah finds its education tax dollars stretched thin.

Establishing the context for IAIMS was an important step in strategic planning. One of the most intriguing and entertaining facets of the planning process was the scenarios for the future written by the various members of the IAIMS Task Force. Initially, the scenarios seemed to be merely an intellectual exercise, but in fact they proved to be useful in constructing a long-range view of IAIMS. From these scenarios emerged applications of large-database access, a variety of network applications, and sophisticated expert systems. These visions of the future formed the basis of the IAIMS goals and were subsequently incorporated into the institutional plan.

Throughout the IAIMS planning process, the HELP system was an ever-present concrete example of the importance of the IAIMS efforts, particularly as an administrative model for information management. Because the impact of HELP will be felt across the health sciences campus, a three-level administrative framework was formed to direct the installation and operation of the system. To provide planning guidance and establish policy, the Information Steering Committee (ISC) was established. It is chaired by the vice president for health sciences. The members of the ISC are the assistant vice president for health sciences, the hospital administrator, the dean of the School of Medicine, the dean of the College of Nursing, the dean of the College of Pharmacy, the dean of the College of Health, the director of the library, the assistant for information management, and the director of hospital information systems. To address clinical issues relating to the HELP system, the Clinical Computing Control Committee (C4) was constituted with four clinical department chairmen, the chairman of the Department of Medical Informatics, the director of hospital information systems, and representatives from each of the colleges and the library. Finally, the HELP Implementation and Coordinating Committee (HICC) is responsible for implementing the plans and priorities established by the other committees. In addition to these committees, the IAIMS Task Force continues to provide planning and policy assistance to the vice president for health sciences and to coordinate current IAIMS projects.

Bishop has suggested that successful IAIMS implementation requires "institution-wide unitary management and patterning" [5]. The experience at the University of Utah does not confirm this prediction. For example, hardware standardization by executive fiat is simply not possible. In part this is the result of the passage of time; there are simply too many machines in place. Any institution that

allows autonomy for departments and colleges will find it difficult to tell income-generating departments how they can spend their money. Equally as important, the influence of any IAIMS project must be cultivated carefully. This can be accomplished best in a constructive framework. The resulting strategy for information policy has been what is called the "carrot" approach, as opposed to the "stick" approach. As an example, de facto hardware standards have been established through a favorable purchase agreement with Apple Computer and the manufacturer of an IBM PC clone. These standards were further enhanced when the university decided to provide on-campus maintenance for microcomputers. Both steps were administrative decisions that encouraged more than 10,000 faculty members, staff members, and students to purchase microcomputers.

It is an administrative assumption of the Matheson Report that a senior administrator, a vice president for information services, is needed to oversee the institution-wide IAIMS. This approach is being considered with great caution at the University of Utah. Certainly, the institution had made a major commitment with a three-year $20 million investment in campus computerization. Approximately one third of this investment is the result of a tuition surcharge that has been approved by the students. Because this is a university-wide investment, coordination is essential, but there are reservations concerning a new vice president. The libraries on campus would probably fall within the purview of this new vice president and would be administratively separated from their traditional academic responsibilities. While libraries might work with other areas of complementary services, such as computing facilities or printing services, consideration must be given to the possibility that such a separation might result in libraries' being considered just a support service. The next logical step might be to expect libraries to operate as cost recovery systems, as other support services do.

The complexities of the administrative issues are only one aspect of the most challenging IAIMS task. An institutional information policy presents political risks that can swiftly destroy an IAIMS. At the University of Utah, this process has been based on persuasion—the "carrot" approach—and as a result it has proceeded slowly. A strong support base has been essential. A large amount of time has been invested in persuading the autonomous health sciences areas that movement toward an information policy is in their best interest. Before the new policy was formed, a careful review of existing policies and procedures was conducted. A number of areas had already been addressed, including copyright, privacy, security, and commercial rights to information. The central feature of IAIMS is that it must be a continuous effort, and this certainly is the case with information policy. Even as some issues are being addressed, other new concerns are appearing. As an example, the policies and procedures for the acquisition of computer hardware have been a major focus of the IAIMS Task Force. With the clarification of this process, it is now necessary to consider the management of the ongoing operating expenses that are so crucial. Currently, the university is proposing that these expenses be considered as a separate line item in the university budget. If this proposal is successful, how will these funds be allocated and who will be responsible? Should the allocation of these funds be used to encourage educational applications of computers? There is no more difficult aspect of the IAIMS process than its information policy.

From the very beginning, there has been a consensus on the outline of an implementation plan for IAIMS. The backbone of the system is the communications network. Again, with the "carrot" approach, it was decided that no one would be required to connect to the network. Use of the network would be encouraged by offering major information resources through it. The HELP system, the primary information resource for clinical and research data, is perceived as the primary network magnet. In addition, the ILS systems for all libraries on the campus will be accessible through the network. Currently, the existing campus-wide closed-circuit television network is being evaluated for use in high-speed data transmission.

Toward the end of the IAIMS contract, it became clear that a proposal would be submitted for additional funding of IAIMS at the University of Utah. This proposal consisted of three major components. The first area was the continuation of IAIMS planning and policy. The second part involved model projects in each college and the School of Medicine focusing on the creation of the components of the HELP system. The final area was the investigation of a link between the HELP system and an integrated library system. The preliminary investigation of the HELP/ILS link will examine how the expert decisions can be documented in the literature and how the judgments can be maintained over time. In addition, an expert-filtered database generated as a result of the HELP system documentation will be accessible via the library's integrated library system.

Conclusion

The University of Utah's experience has shown that there are tremendous opportunities and risks for a library in the IAIMS process. It is difficult for a library to lead the IAIMS initiative at an institution, because libraries usually lack political clout. Leadership must be at the highest possible institutional level. This is not to say the library cannot have an impact on IAIMS. Matheson accurately observes that the library can provide the neutral territory conducive for discussion and decisions. In fact, the library at the University of Utah can best be described as a facilitator. Administration of IAIMS has been done in the library by the library faculty and staff. This identification with IAIMS has enhanced the library's position in the academic community. While the library could not lead, as a facilitator the library has been able to contribute to and influence the direction of IAIMS.

Although we are now into the growth phase of IAIMS, the planning tasks continue. The information policy is still evolving and must be adopted officially by the health sciences areas and eventually by the university and be included in the *Policies and Procedures Manual.* The administrative structure created to manage HELP should be expanded to include IAIMS. There have been no final decisions on a network structure for the university. There are still questions about whom to include, the network objectives, and the technical requirements for a network. IAIMS has not provided all the answers, but the University of Utah is addressing issues and working together to meet the challenges of information management.

The Matheson Report and the National Library of Medicine have set the agenda for this generation of librarians. Variations of the IAIMS theme are emerging in every institution. The question is not whether IAIMS will be implemented, but how libraries will participate in this effort. The IAIMS strategic planning process is already producing benefits for the library at the University of Utah. The leadership of the National Library of Medicine has provided a model for libraries to determine their own future, rather than to be swept along by forces beyond their control.

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